



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,702	08/30/2000	Brian A. Vaartstra	150.00800102	2471

7590 02/27/2002
Attn: Ann M Mueting
Mueting Raasch & Gebhardt PA
P O Box 581415
Minneapolis, MN 55458-1415

EXAMINER

BARRECA, NICOLE M

ART UNIT	PAPER NUMBER
----------	--------------

1756

DATE MAILED: 02/27/2002

5

Please find below and/or attached an Office communication concerning this application or proceeding.

T.D.S

Office Action Summary	Application No.	Applicant(s)	
	09/651,702	VAARTSTRA, BRIAN A.	
	Examiner	Art Unit	
	Nicole M. Barreca	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. Claims 19-32 are pending in this application.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It only identifies one address for the inventor. Both a mailing or post office address and residence for the inventor need to be identified. A mailing or post office address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing or post office address should include the ZIP Code designation. The mailing or post office address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76. The residence identifies the city and either state or foreign country of residence of each inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: element 33 in figure 3. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 29 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29 recites "wherein a ratio of the first component to the second component in the supercritical state". It is unclear if the first component, the second component or both are meant to be in the supercritical state in this claim. Also please note that the first component was previously claimed in 27 to be in the supercritical state.

Claim 31 recites "preferably in the range of". The use of "preferably" in this phrase renders the claim indefinite.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 19, 20, 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishikawa (US Patent 4,944,837).

8. Nishikawa disclose a method for processing an article in a supercritical atmosphere. A resist film is developed in the supercritical atmosphere in order to selectively remove portions of the imaged resist (col.2, 23-39). The fluid used may selected from the group consisting of carbon dioxide, inert gases, hydrocarbons, fluorocarbons, halogens and oxygen (col.9, 5-62).

9. Claims 19, 20, 23, 25, 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Chao (US Patent 5,482,211).

10. Chao discloses supercritical fluid cleaning apparatus. The apparatus may be used for cleanings such as particulate removal, defluxing, degreasing, organic decontamination, and spot cleaning during circuit board assembly (col.2, 59-col.3, 9). Examples of the cleaning fluid (applicant's first component) include carbon dioxide, nitrogen, oxygen, nitrous oxide, methyl fluoride, argon, helium, xenon, methane, ethane and propane, with carbon dioxide being the most preferred (col.3, 53-59). The cleaning fluid may also contain up to 50 volume percent of a co-solvent (applicant's second component) such as ethanol, kerosene, carbon dioxide, nitrogen, oxygen, nitrous oxide, methyl fluoride, argon, helium, xenon, ethane and propane (col.10, 65-col.11, 7).

11. Claims 19, 20, 23, 25, 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Jackson (US Patent 5,013,366).

12. Jackson discloses a cleaning process for removing contaminants from a substrate by shifting the phase of a dense phase gas between temperatures above and

Art Unit: 1756

below the critical temperature of the dense gas. Examples of gases include hydrocarbons, halogenated hydrocarbons, carbon dioxide, ammonia, helium, krypton, argon, nitrous oxide and mixtures thereof. Carbon dioxide is the preferred dense gas (col.3, 36-65). The process may be used for removing photoresists, organic and inorganic materials from substrates (col.7, 1-32). The dense phase gas may be modified by adding methanol or hydrogen peroxide (col.10, 1-3). Surfactants or ozone may also be added to enhance the cleaning process (col.11, 29-33). The dense phase gas may also be a mixture of a first dense phase fluid, such as an oxidant, which chemically reacts with the contaminant to facilitate the removal and a second dense phase fluid which serves as a carrier. Examples of oxidants include ozone, oxygen, hydrogen peroxide or nitrous oxide (applicant's second component). Examples of carriers include carbon dioxide, xenon, argon, krypton or ammonia (applicant's first component). See column 12, line 66 through column 14, line 8. Example 1 teaches a dense gas mixture comprising 90% volume carbon dioxide and 10% volume nitrous oxide (9:1), while example 4 teaches a mixture of 75% volume carbon dioxide and 25% volume ammonia (3:1).

13. Claims 19-21, 23-28, 30 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Vaartstra (US Patent 6,149,828).

14. Vaartstra disclose a supercritical composition. The supercritical component can be ammonia, carbon dioxide, nitrous oxide, He, Ne, Ar, chlorine or bromine (col.5, 23-35). The nonsupercritical component may be ammonia, hydrogen peroxide, nitrous oxide, ozone, sulfur dioxide, or sulfur trioxide (col. 5, 56-66). The supercritical

Application/Control Number: 09/651,702

Art Unit: 1756

composition may further include oxidizers, such as hydrogen peroxide, ozone, oxygen, halogens, sulfur dioxide and sulfur trioxide, which may be in the supercritical state (col.6, 46-50).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 21, 22, 24, 26, 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (US Patent 5,013, 366) as applied to claims 20, 23, 25 or 27 above, and further in view of Gupta (US Patent 5,037,506).

17. Jackson teaches a supercritical composition comprising a fluid mixture comprising a first fluid which chemically reacts with the contaminant in order to facilitate removal, such as an oxidant, and a second fluid which acts as a carrier. Jackson however does not disclose that the oxidant or first fluid is sulfur trioxide. Gupta discloses a method of removing organic materials, such as implant and deep UV hardened photoresist, from a substrate by using sulfur trioxide. Sulfur trioxide is used to oxidize and remove all types photoresist layers, coatings and polymers from the surface of a device. Sulfur trioxide is an extremely strong oxidizing agent and is very effective in removing plasma hardened photoresist in post etch carbon-fluoride containing polymers from submicrometer grooves and crevices. The oxidizing power of sulfur trioxide is uniquely suitable for removal of side walled polymers. See column 3, lines 3-22.

Art Unit: 1756


Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use sulfur trioxide as the oxidizing agent in the supercritical fluid in the contaminant removal method of Jackson because Gupta teaches that sulfur trioxide is an extremely strong oxidizing agent which is very effective in the removal organic materials, such as photoresists.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 703-308-7968. The examiner can normally be reached on Monday-Thursday (8:00 am-6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



nmb 
February 21, 2002

MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700